THE *LORANTHACEAE* OF AUSTRALIA. Part vi.

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(Plates i—xii.)

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Subgenus DENDROPHTHOE.

Petals 5 or 6, united, without basal folds. Filaments not barbed.

Sect. Lysiana.

Flowers solitary, binate or in clusters of 3-5, with or without a common peduncle. Corolla usually 6-merous.

i. Leaves terete or nearly so.

1. Flowers 2 cm. long, solitary or in pairs, without a common peduncle. Pedicels elongated. Leaves usually alternate, single or fascicled ..... 32. *L. Murrayi.*
   Flowers 1.3-1.5 cm. long ..... var. *parviflora.*
1a. Flowers binate, pedicellate, the common peduncle elongated. Leaves opposite, sub-filiform ..... 33. *L. Mitchellianus.*
2. Flowers in pairs or clusters. Common peduncle very short or almost obscure. Leaves firm, somewhat flexuose, acute ..... 34. *L. Casuarinae.*

ii. Leaves flat.

1. Flowers green at the top, red at the base. Leaves opposite or sometimes alternate, narrow-oblong, penninerved, 3-8 cm. long ..... 35. *L. Exocarpi.*
2. Leaves slender, 10-15 cm. long ..... (*a*) var. *tenuis.*
1a. Flowers yellow. Leaves narrow, 3-6 cm. long ..... (*b*) var. *flavescens.*
2a. Leaves cuneate-spathulate, venulose, 2-3 cm. long ..... (*c*) var. *venulosa.*
1b. Flowers red, 3.5 cm. long. Leaves narrow, oblong to falcate-lanceolate. ..... (*d*) var. *coccineus.*
1c. Flowers 2.5 cm. long. Leaves spathulate, 6-10 cm. long. (*e*) var. *spathulata.*

Sect. Amylotheca.

Inflorescence cymose or subumbellate. Flowers in triads, the central flower sessile. Style capillary. Apex of ovary prismatic.

1. Leaves broad, oblong to lanceolate, veins reticulate .... 36. *L. dictyophlebus.*

Ser. *Eudendrophthoe.*

Flowers binate, racemose or in axillary clusters. Corolla inflated in the middle. Petals 5, rarely 6.

i. Young shoots and inflorescence glabrous.

1. Flowers in pairs on slender pedicels. Leaves petiolate, alternate, lanceolate ..... 37. *L. acacioides.*
2. Flowers racemose. Leaves opposite, sessile, cordate .. 38. *L. homoplasticus.*

ii. Young shoots and inflorescence pubescent, except in var. *glabrescens.*

1. Indumentum ferruginous. Racemes 10—20-flowered ..... 39. *L. vitellinus.*
1a. Racemes strictly glabrous ..... var. *glabrescens.*

2. Indumentum hoary-tomentose. Racemes 3—7-flowered. Corolla minutely pubescent inside ..... 40. *L. odontocalyx.*
2a. Indumentum rufous-cinereous. Corolla glabrous inside ..... var. *propria.*

Ser. *Benthamina.*

Flowers red, binate, ferruginous; bracteate pedicels rarely longer than the calyx. Corolla cleft nearly to the base on one side only; petals 5, very short.
1. Leaves ovate to obovate, thick. Buds slender, arcuate, rust-coloured. ..... 41. *L. alyxifolius.*

Subgenus Dendrophthoe Blume.

Blume, *Fl. Javae*, 1829, 13; Mart., *Flora*, 1830, 109; Engl. in Engl. et Prantl, *Pflanzenfam.*, Nachtr. ii, iv, 1897, 129.

Petals, 5 or 6, united, without basal folds. Filaments not barbed.

Sect. Lysiana (Van Tiegh.).

Engler, *l.c.*, 126.

Flowers solitary, binate, or in clusters of 3-5, with or without a common peduncle. Corolla inflated towards the middle, unequally 6-cleft. Filaments diminishing upwards. Anthers linear, acute, becoming curved as the flower fades. Style usually terete; stigma subcapitate. Fruit ovoid to globose, red; endosperm slightly furrowed; embryonic cotyledons very short, lanceolate, slightly spreading; hypocotyl often long and verrucose, with suctoral papillae; embryonic cotyledons withdrawn from the endosperm on germination. Erect or pendulous glabrous shrubs with terete, or narrow venulose leaves; union ball-like, without adventitious roots.

The species belonging to Sections Lysiana and Amylotheca are placed under *Elytranthe* by Engler (in Nachtr. *l.c.*), but I have transferred them to *Loranthus* for reasons partly expressed under Section Neotreubella (These Proceedings, xlvii, 1922, 7). The only characters which seem to vary unessentially from those of *Elytranthe*, are the corolla and the anthers. But as the same characters are also peculiar to some species of *Loranthus*, in contradistinction to the two or more celled ovary of *Elytranthe*, it seems to me that the species referred to are more closely allied to *Loranthus* than to *Elytranthe*. It must be borne in mind that the ovary of various species of *Loranthus*, although 1-celled, sometimes contains 2 embryos, and is apt to be mistaken for a 2-celled ovary.

32. Loranthus Murrayi F. v. M. et Tate. Plate i.

Mueller et Tate, *Trans. Roy. Soc. S.A.* vi, 1883, 109; Tate, *Handbook Fl. Extra-Trop. S.A.* 1890, 106.—*Elytranthe Murrayi* (F. v. M. et Tate), Engler, *l.c.*

Glabrous, leaves alternate, semi-terete, slender, not exceeding two inches in length, sometimes attenuated at the base; flowers mostly solitary, sometimes in pairs on flattened, shortly winged pedicels, about ½-inch long, without a common peduncle; bracts unequally bilobed, conspicuous, decurrent on the pedicels; calyx-tube prominent, glaucous, its border truncate and obscurely toothed; petals usually 6, about 10 lines long, united to about two-thirds their length into a slightly dilated tube; corolla tube pale-yellow; segments linear-lanceolate, yellow below, pale rose above; stigma capitate; style and filaments brown; anthers adnate, broadly linear; unripe fruit globular, glaucous.

Supplementary Notes to the Description.

Branches virgate, lenticular, and apparently pendulous; mode of attachment unknown. Leaves opposite, alternate, or more often fascicled at the intersection

of the abortive branches, compressed, linear, contracted at the base or nearly terete. Flowers rarely in pairs; bracts sometimes exceeding the calyx, and occasionally semi-foliaceous and more decurrent than in any of the allied species. Buds slightly curved, but occasionally much curved, usually acute, inflated upwards; corolla 2 cm. long; style angular, with a raised circular disc at its base; cotyledons unknown.

Range.—Up till now this species has only been recorded for South Australia and Western Australia; it is now recorded for the first time as an addition to the flora of New South Wales and Queensland from the following localities:

New South Wales.—Paldrumatta Bore, Wilcannia (on *Acacia aneura*); Momba; Rowenia Tank, five miles from Mootwingie Hills (on *L. Exocarpi*); Urisino-Thurloo Downs, Paroo River (on *Acacia excelsa*, *Heterodendron oleaefolium*).

Queensland.—Near Charleville (on *Eremophila Mitchelli*).

South Australia.—Spencer's Gulf; north-east part of Lake Torrens Basin; Upper Arkaringa Valley (on *Acacia salicina*); Musgrave Range; Idyaka, near Termination Hill; Aroona Range, the type locality; Albergia River; Mount Lyndhurst; near Tarcoola.

Western Australia.—Upper Gascoyne River.

Affinities.—Besides its affinity with *L. linearifolius* (*L. Mitchellianus*, as pointed out by Professor Tate, *l.c.*), some of the very narrow leaved forms of *L. Exocarpi* var. *tenuis* resemble it in the shape of both the leaves and flowers, but the pedicels are very dissimilar. To *L. Gaudichaudi* DC., it is allied in its spherical fruits, and somewhat in the leaves, especially the short, compressed leaved forms, but the flowers are totally different. *L. Murrayi* is distinguished from all the Australian species by its decurrent bracts which give the pedicels a slightly winged appearance.

Hosts.—Leguminosae: *Acacia aneura* F. v. M., *A. excelsa* Benth., *A. salicina* Lindl. Sapindaceae: *Heterodendron oleaefolium* Desf. Myoporaceae: *Myoporum Mitchelli* Benth.

LORANTHUS MURRAYI, var. PARVIFLORA S. Moore.

Journ. Bot. xxxv, 1897, 170, as *L. miniatus; Journ. Linn. Soc. Lond.* xxxiv, 1898-1900, 225-6.

Flowers pale greenish below, yellow or orange above. Berries dark red. Near Goose's Soak and Kilkenny Soak, Western Australia.

The author refers to this plant as follows: "Since writing my memoir (vide loc. cit.) on the camel-fodder plants of West Australia, I have had the opportunity of seeing at Kew, specimens of *L. Murrayi*, the affinity of which, with my supposed new species, *Loranthus miniatus*, I have already alluded to. I find that the Elder Expedition specimen referred to *L. Murrayi* has the peculiar habit of mine, viz., leaves crowning subobsolete branches; and as the flowers, except for their reduced size, are essentially similar to those of typical *L. Murrayi*, it would be better to consider the West Australian plant as a small-flowered variety of the South Australian plant."

I have not seen this variety, which appears to differ from the typical form chiefly in the smaller pedicels and flowers.

Synonym.—*L. miniatus* S. Moore.

Host.—Leguminosae: *Acacia* sp.

33. Loranthus Mitchellianus, n. sp. Plate ii.

Hook., *Mitch. Trop. Aust.*, 1848, 102, as *L. linearifolia;* Walp., *Rept. Bot.* ii, 1851-52, 730; Benth., *B. Fl.* iii, 1866, 392; Tate, *Handb. Fl. Ext.-Trop. S.A.*, 1890, 106; Moore et Betche, *Handb. Fl. N.S.W.*, 1893, 228; Bail., *Fl. Q'land*, v, 1902, 1379.

The name *L. linearifolius* is already occupied by a Chilian species (vide Bert., Merc. Chili, 1829, ex *Am. Journ. Sci.* xxiii, 1833, 95). Therefore, I propose the name *Mitchellianus*, in honour of the collector, Lieut.-Col. Sir Thomas Mitchell, Surveyor-General of New South Wales, 1845.

The following is a translation of the original description: Leaves glabrous, carnose, terete, linear-filiform, acute; peduncles axillary, shortly biflorous; calyx cylindrical, truncate, contracted; petals 6, linear, cohering above the base.

Supplementary Notes to the Description.

Pendulous shrubs with long, slender, glabrous, reddish-brown branches, covered with numerous orbicular lenticels. Union ball-like; leaves chiefly opposite, filiform, semiterete, acute, 2-8 cm. long, straight or curved, the apex sometimes uncinate. Flowers glabrous, red, tipped with green or yellow, in pairs on slender, axillary, and sometimes terminal peduncles; the common peduncle slightly thicker than the pedicels, 3-9 mm. long, the pedicels longer, flat, broader towards the top. Bracts cordate, acute, or truncate, and occasionally bilobed, pale coloured, decurrent on the pedicels. Calyx cylindrical, with a minute obscurely denticulate limb. Buds 2-2½ cm. long, inflated in the middle to a diameter more than twice the size of the contracted, curved upper portion. Corolla semi-transparent, divided to about one-third of its length into 6 slightly unequally acute petals, which are narrower at the attachment of the filaments, and considerably broader towards the base, deflexed or recurved after anthesis. Filaments of unequal length, the free portion much larger than the adnate portion. Anthers adnate, oblong, linear, 2 mm. long; style terete, curved in bud, the base conoidal, and the most persistent on the fruit of all the Australian species. Stigma small, scarcely capitate. Fruit elliptical to ovate-oblong, 12 mm. long, whitish to pale pink. In a dry state they resemble the dried fruits of *Persoonia pinifolia.* Seeds elliptical, slightly sulcate; the endosperm almost separable into several divisions without laceration, as in the seeds of *L. dictyophlebus;* hypocotyl slender; suctoral disc flat, surrounded by a fringe of rather long green papillae; cotyledons not seen.

The type locality is on the Narran River, in the vicinity of Angledool; it was collected by Mitchell, on March 24th, 1846 (vide Mitchell's Tropical Australia, 101-2. "A beautiful new Loranth, with red flowers tipped with green was parasitic on *Capparis lasiantha.*").

Economic Uses.—Stock Inspector A. W. Mullen reports that stock are very fond of this species, and that in many cases they will not eat the tree on which it grows. Spencer L. Moore (*Journ. Bot.* xxxv, 1897, 170) includes this species amongst the Camel fodder plants of Western Australia.

Synonyms.—*L. linearifolius* Hook., *Elytranthe linearifolius* (Hook.) Engler.

Range.—*L. Mitchellianus* is almost exclusively a desert species, inhabiting the drier parts of the continent, and it is frequently parasitic upon *Acacia* and other soft-wooded plants. Its present range extends from Coonabarabran, in New South Wales, to Irwinbank, in Queensland, and, crossing the central portion of South Australia, it makes its appearance in Western Australia at Murrin Murrin,

in the Great Victoria Desert, and at Cue, in the Gibson Desert, and then extends in a north-westerly direction from Cue to Sharks Bay.

Affinities.—Near *L. Murrayi* F. v. M. et Tate, from which it differs in the geminate flowers, smaller bracts, and differently shaped fruits.

Its affinity to *L. Casuarinae* lies chiefly in the similarity of the flowers, and somewhat in the leaves. The chief character of differentiation between these species is the furcate peduncle of *L. Mitchellianus*, which is always well developed, as against the very short or imperfectly developed common peduncle of *L. Casuarinae;* there is also a marked difference in the leaves, those of the latter are always more rigid and thicker than those of the former.

The very delicate and slender forms of *L. Exocarpi* var. *tenuis* show a close resemblance to *L. Mitchellianus;* the arrangement of the flowers, however, sharply separates them, as in *L. Casuarinae;* and the base of the style is not enlarged to the same extent as in *L. Mitchellianus.*

Hosts.—Casuarineae: *Casuarina* sp. Proteaceae: *Grevillea striata* R. Br., *Hakea Preissii* Meissn. Capparidaceae: *Capparis lasiantha* R. Br., *Apophyllum anomalum* F. v. M. Leguminosae: *Acacia aneura* F. v. M., *A. Burkitti* F. v. M., *A. colletioides* A. Cunn., *A. excelsa* Benth., *A. sentis* F. v. M. Rutaceae: *Flindersia maculosa* F. v. M. Myoporaceae: *Eremophila Mitchelli* Benth.

34. Loranthus Casuarinae Miq. (*non* Ridley). Plate iii.

Lehm., *Pl. Preiss.*, 1844-5, 279; Walp., *Rept. Bot.* v, 1845-6, 938; Mueller, *Rept. Burdk. Exped.*, 1860, 18.

The following is a translation of the original description: Glabrous, branches terete; leaves subopposite or opposite, terete-filiform, succulent, coriaceous, shortly mucronate, glabrous. Flowers axillary, pedicellate, solitary or in pairs on the common peduncle. Calyx-limb obscurely denticulate. Petals 6, narrow-linear, cohering and terete-clavate in bud, at length free. Stamens inserted on the upper half of the petals; anthers linear, of equal length. Style filiform.

Parasitic on *Casuarina*, on the plains above Perth, 13 May, 1839, Herb. Preiss, No. 1615. Branches terete; branchlets trichotomous or alternate, smooth, dark ashy-grey, easily broken. Leaves somewhat rigid, green, terete, subopposite, rarely perfectly opposite, wrinkled when dry, straight or subflexuose, terminating in a short mucro, 5-10 cm. long, 1-3 mm. thick. Flowers axillary, solitary or in pairs; the common peduncle 2-4 mm. long; pedicels about 1 cm. long; basal bract ovate, shortly acute, concave, carnose. Buds cylindrical or subclavate, slightly curved towards the top. Calyx 4 mm. long, obconic, the limb pale, obscurely denticulate. Petals linear, the apex dilated and acute. Anthers 7 mm. long.

Bentham reduced it to a synonym of *L. linophyllus* Fenzl. I have not seen Preiss. No. 1615, but from the description it seems to belong to the Dendrophthoe group rather than to Euloranthus. I am also influenced in arriving at this decision by the investigation of specimens collected by Mr. W. V. Fitzgerald, near Perth, the type locality, with the following note by Mr. Fitzgerald: "Flowers from red to greenish or yellowish red. Fruit scarlet, with viscid pulp." The flowers are identical with those of *L. Exocarpi* Behr, with the characteristic short, thick, common peduncle, giving rise to two short, deflexed pedicels. The leaves are terete, straight or flexuose, ending in a short mucro. The branches are also very similar to those of *L. Exocarpi*, and quite distinct from the branches of *L. linophyllus.* I received the loan of another specimen from Professor Ewart,

Melbourne Herbarium, which was labelled as follows: *Loranthus Casuarinae* Miq., Red Point, Western Australia, Oldfield; *L. linophyllus* Fenzl. The latter name is in Baron von Mueller's handwriting; the former, probably that of the collector, Oldfield. The leaves are quite glabrous, mostly opposite, compressed-terete, acute and firm, 3 inches long, and articulate on a rather broad, circular base. Flowers reddish, with the same characters as *L. Exocarpi*.

I have not seen any other specimens like the above, especially in regard to the terete, flexuose, acute leaves, and they are unlike other slender forms of *L. Exocarpi*. This form, no doubt, is *L. Casuarinae* Miq.

James Drummond (Notes on the Botany of Western Australia, *Hooker's Journ. Bot.* v, 143) refers to this species as follows: "On Messrs. Davis and Walcott's station on the Greenough are two new species of *Loranthus*, both parasitic on the 'Raspberry Jam.' One of them resembles *L. Preissii* in foliage, but the tubes of the flowers are longer and narrower, and of a different colour, the lower part of the tube red, the upper yellow; they are also of a different shape, having a sort of ringent mouth."

Mueller (*Rept. Burd. Exped.*, 12) makes the following comment on this species: "*L. Casuarinae* Miq. is as yet in its normal form with cylindrical leaves only found in the Western extra-tropical portion of our continent, reaching to Chamber's Creek eastward. But it appears that only the flat leaves distinguish *L. Exocarpi*, whilst in a specimen gathered near Lake Torrens the leaves are semiterete. If the very characteristic black berry of *L. Exocarpi* is identical with that of *L. Casuarinae* we cannot hesitate to combine both."

In reference to the fruit of *L. Casuarinae*, Mr. W. V. Fitzgerald states that it is scarlet. But as the fruit of *L. Exocarpi* is red before it turns black, the fruit of *L. Casuarinae* may change from red to black also. This point can only be settled by further field investigation. I quite agree with Mueller that the main difference between *L. Casuarinae* and *L. Exocarpi* is in the leaves. All the other characters appear to be the same in both species. *L. Casuarinae* Miq. is the oldest name; it was described two years before *L. Exocarpi* Behr., but as the latter name has been in use for the last seventy odd years, and as it is readily distinguished from *L. Casuarinae* in the leaves, I think it should also be recognised as a distinct species.

Synonym.—*L. linophyllus* Benth. (*non* Fenzl), *Elytranthe Casuarinae* (Miq.) Engler.

Range.—*Western Australia*: Perth (on *Casuarina* sp., Preiss, No. 1615, the type); Comet Vale (on *Casuarina glauca*); Greenough River (on *Acacia acuminata*); Red Point.

South Australia: Chamber's Creek; Lake Torrens. I have not seen these specimens, but they appear to be referable to this species.

Hosts.—Casuarineae: *Casuarina glauca* Sieb. Leguminosae: *Acacia acuminata* Benth.

35. Loranthus Exocarpi Behr. Plate iv.

Behr, *Schlecht. Linnaea*, xx, 1847, 624; Walp., *Rept. Bot. Syst.* i, 1848-9, 364; Miq., *Ned. Kruidk. Arch.* iv, 1856, 105; Benth., *B. Fl.* iii, 1866, 392; Etting., *Über die Blatts. der Lor.*, iii, Figs. 14, 15; Muell., *Key Vic. Pl.* i, 1887-8, 273; Eng., Engl. et Prantl, *Pflzfam.* iii, i, 184, Fig. 126; Moore and Betche, *Fl. N.S.W.*, 1896, 228; Bail. *Qland Fl.* v, 1902, 1397; Tate, *Handb. Fl. Ext.-Trop. S.A.*, 106.

I have not seen the original description; those already referred to are very similar to each other, and for preference I give that of Bentham.

Glabrous. Leaves mostly opposite, but here and there alternate, from oblong-cuneate to narrow-linear, but always flat, obtuse, narrowed into a petiole, mostly 1½ to 2½ inches long, rather thick, often triplinerved. Flowers axillary, pedicellate, solitary or in pairs, on thick pedicels, sessile or more rarely borne on a very short common peduncle. Calyx border obscurely toothed. Petals usually 6, above 1 inch long, united to about one-third of their length. Anthers adnate, linear.

Supplementary Notes.—Usually pendulous shrubs with a ball-like union, often forming dense drooping masses; branches terete, reddish-brown with numerous lenticels, 2-3 feet long, but sometimes longer. Leaves of the typical form 1-3 inches long, ¼-½ inch broad, quite glabrous, penninerved, never strictly triplinerved. Flowers in axillary clusters of 3-4, or more often solitary, or in pairs on a very short, thick peduncle; the pedicels twice as long as the calyx, the top of which is somewhat rounded into a slightly thickened disc. Bracts small, usually cordate, acute, occasionally truncate, or minutely trilobed and spreading. Calyx very narrow, cylindric, the limb small, irregularly denticulate. Buds curved, acute, inflated in the middle, usually more than 1in. long, the lower portion reddish, green towards the top. Petals 5 or 6, linear-lanceolate, unequally cleft, with a small thickened callosity at the base, the lower one divided to about the middle of the corolla, the upper ones scarcely to the middle, all abrupty deflexed near the attachment of the filaments. Filaments reddish, though sometimes yellowish or greenish, the free portion about the same length as the very narrow, curved anthers; the cells of the latter very narrow, membranous and fragile. Style faintly angular, and when enclosed in the bud, bent from one side of the corolla to the other in a distinct wave, and actually shorter than the anthers, pale green in the lower portion, reddish towards the top; stigma ovate, not large. Disc circular, very small. Fruit elliptical, 8-10 mm. long, bright yellow to reddish, turning black when over-ripe; seeds ovate-elliptical, longitudinally 5-furrowed; hypocotyl verrucose in the dormant seed, about half the length of the entire embryo; embryonic disc slightly enlarged; endosperm and embryo green, the former hard, the latter nail-shaped; embryonic cotyledons very short, scarcely 1 mm. long, and about as broad, somewhat emarginate. On germination the hypocotyl is minutely verrucose with suctoral papillae and it becomes elongated, sometimes exceeding 2 cm.; suctoral disc domed, the surface microscopically papillose, and with a ring of longer papillae at its base, which soon falls. The cotyledons appear to withdraw from the endosperm on germination.

The life history of *L. Exocarpi* is ably expounded by C. C. Brittlebank (These Proceedings xxxiii, 1908, 650). The seeds are figured in various stages of development, and numerous sections of the plant are shown illustrating its attachment with the various hosts.

The leaves of *L. Exocarpi* (figured by Ettingshausen, *Über die Blatts. der Lor.*, Tab. iii, fig. 14, 15) are strikingly like many of the leaves of the typical form; they are narrow-oblong to narrow-spathulate, 2-2½ inches long.

The type comes from Barossa, where it was collected by Dr. Hans Herman Behr between 1841 and 1846. Barossa is a small mining township situated between the South Para River and Sandy Creek about 25 miles N.N.E. from Adelaide.

Synonyms.—*Loranthus angustifolius* R. Br.; *Elytranthe Exocarpi* (Behr.) Engler.

Range.—Found widely in all the States of the mainland. Like other interior species, it follows closely the saline country and shows considerable variation throughout its wide range. This fact was noted by Bentham, for he says: "the

narrow-leaved forms are common in the south, and the broad-leaved forms are found in the north." As will be seen subsequently, I have separated the various forms into distinct varieties, as some are particularly striking, especially in relation to the shape, length and venation of the leaves, and also in the colour of the flowers.

Affinities.—This species shows affinity with *L. Mitchellianus* in the flowers and their arrangement, but the common peduncle and pedicel are much longer in the latter, the leaves of *L. Mitchellianus* are very narrow, almost terete, and therefore they are very dissimilar from those of *L. Exocarpi.*

Some of the narrow-leaved forms of *L. acacioides* A. Cunn. are likely to be confused with similar leaves of this species, unless the opposite character of the leaves of *L. Exocarpi* is borne in mind, and also its shorter and stouter pedicels, in contradistinction to the slender pedicels of *L. acacioides.*

Stock Food.—Mr. E. Officer, of Zara, near Hay, reports that sheep eat the leaves of *L. Exocarpi* readily.

Hosts.—This is a most polyphagous species as the following hosts will show. Pinaceae: *Callitris cupressiformis* Vent. Casuarineae: *Casuarina stricta* Ait., *C. Luehmanni* R. T. Baker. Moraceae: *Ficus orbicularis* A. Cunn. Santalaceae: *Santalum lanceolatum* R. Br., *Fusanus acuminatus* R. Br., *Exocarpus cupressiformis* Labill., *E. aphyllus* R. Br. Loranthaceae: *Loranthus Quandang* Lindl., *L. Miquelii* Lehm., *L. pendulus* Sieb., *L. miraculosus* Miq., *L. Preissii* Miq. Proteaceae: *Hakea lorea* R. Br., *H. Ivoryi* Bail. Chenopodiaceae: *Chenopodium nitrariaceum* F. v. M. Leguminosae: *Acacia aneura* F. v. M., *A. Burkitti* F. v. M., *A. calamifolia* Sweet., *A. binervosa* DC., *A. dealbata* Link., *A. decurrens* Willd., *A. excelsa* Benth., *A. homalophylla* A. Cunn., *A. implexa* Benth., *A. melanoxylon* R. Br., *A. Oswaldi* F. v. M., *A. pendula* A. Cunn., *A. pycnantha* Benth., *A. salicina* Lindl., *A. sentis* F. v. M., *A. sericata* A. Cunn., *A. tetragonophylla* F. v. M., *A. retinodes* Schl., *Cassia Sturtii* R. Br., *C. pteroloba* F. v. M., *Bauhinia* sp., *Bossiaea Battii* F. v. M., *Templetonia egenea* Benth. Capparidaceae: *Capparis Mitchelli* Lindl., *Apophyllum anomalum* F. v. M. Pittosporaceae: *Pittosporum phyllyraeoides* DC., *Bursaria spinosa* Cav. Rosaceae: (*e*) *Prunus cerasus* L., (*e*) *P. Persica* L., (*e*) *P. amygdalus* L., (*e*) *P. domestica* L., (*e*) *Pyrus Cydonia*, (*e*) *P. communis* L. Rutaceae: *Geijera parviflora* Lindl., (*e*) Lisbon Lemon. Sapindaceae: *Eremocitrus glauca* Swingl., *Heterodendron oleaefolium* Desf. Violaceae: *Hymenanthera Banksii* F. v. M. Myrtaceae: *Angophora lanceolata* Cav., *Eucalyptus populifolia* Hook., *E. rostrata* Schl., *Melaleuca* sp. Oleaceae: (*e*) *Olea Europaea* L. Apocynaceae: (*e*) *Nerium Oleander* L. Solanaceae: (*e*) *Nicotiana glauca* L. Myoporaceae: *Eremophila Brownii* F. v. M., *E. Duttonii* F. v. M., *E. Freelingii* F. v. M., *E. Sturtii* R. Br. Rubiaceae: *Canthium oleifolium* Hook.

(*e*) Denotes exotic plants.

(*a*) Var. TENUIS, n. var. Plate v.

Frutex ramis glabris longis et tenuibus lenticulatis. Folia angusto-linearia recta vel curva, media costa prominento, 10-15 cm. longa. Flores nonnumquam in parvis cymis. Gemmae tenues; petali glauco-virides; corolla rubra; antherae aliquanto longae. Stylus tenuis, plerumque cum corolla caducus; stigma parvum, ovatum. Fructus maturus sanguineus, ovatus, circiter 6 mm. × 5 mm.

Branches glabrous, long and slender, lenticulate; leaves narrow-linear, straight or curved, the median nerve prominent, 10-15 cm. long. Flowers sometimes in small clusters; buds slender; petals sea-green; corolla red; anthers rather long;

style slender, usually falling off with the corolla; stigma small, ovate. Fruit blood-red when ripe, ovate, about 6 mm. × 5 mm.

This is probably the narrow leaved form referred to by Bentham. It is dispersed over four States.

Range.—*Victoria*: You Yangs, near Melbourne; Grampians; Dumosa, near Mt. Wycheproof; near Charlton; Fairview; Dimboola. *South Australia*: Bowerton; York Valley; Ooldea. *New South Wales*: Zara; Griffith; Eangonia, via Dubbo; Belmont, Lake Macquarie; West Bogan; Coolabah; Byrock; Glendon; Baeramia, Denman; Gungal; Narrabri; Pilliga; 40 or 50 miles N.W. of Collarenebri; Boggabri; Mungindi. *Queensland*: Stannary Hills.

Hosts.—Casuarineae: *Casuarina glauca* Sieb., *C. lepidophloia* F. v. M., *C. paludosa* Sieb., *C. Luehmanni* R. T. Baker. Loranthaceae: *Loranthus linophyllus* Fenzl. Santalaceae: *Exocarpus aphylla* R. Br., *E. cupressiformis* Labill. Pittosporaceae: *Bursaria spinosa* Cav., *Pittosporum phyllyraeoides* DC. Proteaceae: *Hakea vittata* R. Br. Leguminosae: *Acacia excelsa* Benth., *A. Oswaldi* F. v. M., *Cassia eremophila* A. Cunn., *C. Sturtii* R. Br., *Jacksonia scoparia* R. Br. Sapindaceae: *Eremocitrus glauca* Swingl., *Heterodendron oleaefolium* Desf. Rutaceae: *Geijera parviflora* Lindl.

(*b*) Var. FLAVESCENS (Muell.) Miquel. Plate v.

Ned. Kruidk. Arch. iv, 1856, 105; F. v. M. and Tate, *Trans. Roy. Soc. S.A.* xvi, 1892, 360, as var. *lutea*, without a description.

The following is a translation of the original description: Flower tube yellow; leaves long and narrow, rather curved; branches divaricate.

No definite locality is quoted by Mueller for this variety, but there is reason for assuming that it came from the southern parts of the continent, probably from Victoria. Max Koch (*Trans. Roy. Soc. S.A.* vi, 1900, 83) states that "a form with yellow petals and green at the summit is often found."

Range.—*Victoria*: Near Mount Charlton. *New South Wales*: Nyngan (on *Acacia stenophylla*). *Queensland*: Knockbreak Station; Eidsvold (on *Casuarina Luehmanni*. Flowers tubular, of an orange colour, Dr. T. L. Bancroft). *South Australia*: Morphett Vale (petals bright lemon yellow, with green tips, C. F. Johncock, *Trans. Roy. Soc. S.A.* xxvi, 1901, 253); Mt. Lyndhurst; Cootanoorina (on *Acacia* sp.; the type of var. *lutea* F. v. M. and Tate, *l.c.* Leaves narrow lanceolate, to falcate lanceolate, obtuse, 1½ to 2½ inches long. Flowers the same as in *L. Exocarpi*, but yellow, shaded green). *Western Australia*: Comet Vale (on *Casuarina glauca*. Leaves linear as in var. *tenuis*, buds yellow, slender).

Differing from *L. Exocarpi* in the narrow leaves and yellow flowers.

Synonym.—*L. Exocarpi* Behr. var. *lutea* F. v. M. and Tate.

Hosts.—Casuarineae: *Casuarina glauca* Sieb., *C. Luehmanni* R. T. Baker. Leguminosae: *Acacia stenophylla* A. Cunn.

(*c*) Var. VENULOSA, n. var. Plate v.

Folia cuneato-spathulata aliquanto lata, fortiter venala nonnunquam bis-vel tripli-vernata. Flores recentes glauco-virides vertice, basi in colorem stramentum mergentes.

Leaves cuneate-spathulate rather broad, strongly veined, with a tendency to become bi- or tri-plinerved. Flowers when fresh, sea-green at the top, shading into straw-yellow at the base.

Range.—Cobar (on *Acacia colletioides*, J. L. Boorman, 5, 1918, the type). Archdeacon Haviland (THESE PROCEEDINGS xxxvi, 1911, 523) records a yellow flowering form from Cobar; between 16 and 34 miles from Bourke towards Cobar

(on *Acacia aneura*) with yellow flowers in May (vide R. H. Cambage, THESE PROCEEDINGS XXV, 1900, 597); Gunnedah; Narrabri (on *Heterodendron oleaefolium*); Warialda (on *Santalum lanceolatum*).

Hosts.—Santalaceae: *Santalum lanceolatum* R. Br. Leguminosae: *Acacia aneura* F. v. M., *A. colletioides* A. Cunn. Sapindaceae: *Heterodendron oleaefolium* Desf.

(*d*) Var. COCCINEUS (F. Muell.) Miquel.

Ned. Kruidk. Arch. iv, 1856, 105.

The following is a translation of the original description: Tube scarlet; leaves broadish, slightly curved; branches rather erect. Immature berry at first green, then red; mature black, globose, smaller than a cherry, containing a copious quantity of bird-lime. Flowering in summer.

The following is a copy of a label in Melbourne Herbarium in Mueller's handwriting: "*Loranthus Exocarpi* Behr., var. floribus coccini, on *Acacia retinoides*, *Casuarina*, and *Exocarpus*, Murray, F. Mueller, March, 1851." A second label is as follows: "*Loranthus Exocarpi* Behr, var. *rubra* (*Loranthus perfidiosus* Ferd. Mueller). In ramis *Exocarpus cupressiformis*, pes planties versus (?) Lat. Vit. L. Apr. 28th, 1848."

These, no doubt, are the specimens referred to by Miquel (*l.c.*) and probably constitute the type of var. *coccineus*, which appears to differ from the typical form in the colour of the flowers only. However, as fresh specimens are not available, I am inclined to uphold the variety. It will be a matter for local botanists to investigate, and ascertain if the characters are constant, and also whether there are other characters to distinguish it from the typical form.

Range.—It seems to be confined to South Australia.

The name *L. perfidiosus* is an herbarium one only, as is also var. *rubra*.

Hosts.—Santalaceae: *Exocarpus cupressiformis* Labill. Casuarineae: *Casuarina* sp. Leguminosae: *Acacia retinodes*. Schl.

(*e*) Var. SPATHULATA, n. var. Plate v.

Frutex ramis indivisis longis et tenuibus, haud divaricatis ut in typo. Cortex levis rubescens. Folia spathulata vel falcato-spathulata, obtusa, venis, nonnumquam vagis, sed plerumque prominentibus 6-10 cm. longis, petiolo fere 3 cm. longo. Flores minores quam in typo, curvi, siccati obscuro-rubri. Calyx dentatus longibus segmentis. Fructus oblongus, 13 mm. longus; basis styli persistens apud fructum.

Branches simple, long and slender, not divaricate as in the typical form. Bark smooth, brownish; leaves spathulate, or falcate-spathulate, obtuse, 6-10 cm. long, the petiole nearly 3 cm. long. Flowers smaller than the normal form, curved, drying a very dark red; calyx deeply toothed. Fruit oblong, 13 mm. long in a dry state, with the base of the style persistent upon it.

Range.—Confined to the Northern Territory, North Queensland, and North-West Australia.

North Queensland: Settlement Creek (on *Erythrophloeum Laboucherii*). Two of the leaves measure 8 × 4 cm., with three prominent, and three finer veins; Bacon Swamp (on *Eucalyptus* sp., the type); Lander Creek (on *Cassia Sturtii*, *Santalum lanceolatum*. Leaves 3-6 cm. long, spathulate, rather thick, obscurely veined. Buds stout, curved, 2 cm. long. *L. dictyophlebus* F. v. M., Ewart and Davies, *Fl. N.T.*, 88); 106 miles N. of Survey Camp iv (on *Acacia stipuligera*, *A. coriacea*); 20 miles N. of Tennant's Creek, MacDonnell Range (on *Acacia holosericea*); Kelly's Well, near Kelly's Creek (on *Eucalyptus pyrophora* var. *polycarpa*, *Acacia dictyophleba*. The common peduncle in the three specimens is

well developed, sometimes exceeding 4 mm. long). This is probably the variety referred to by Mueller (*Rept. Burdk. Exped.*, 12): "A variety with spathulate leaves I observed in Arnheim's Land and on the Gilbert River."[1]

Western Australia: Near Mount Agnes, Kimberley district (on *Santalum lanceolatum*).

Hosts.—Moraceae: *Ficus* sp. Santalaceae: *Santalum lanceolatum* R. Br. Leguminosae: *Acacia dictyophleba* F. v. M., *A. coriacea* DC., *A. holosericea* A. Cunn., *A. stipuligera*, F. v. M., *Cassia Sturtii* R. Br., *Erythrophloeum Laboucherii* F. v. M. Myrtaceae: *Eucalyptus pyrophora* Benth. var. *polycarpa* Maiden.

Sect. Amylotheca (Van Tiegh.) Engler.

Engler, Engl. et Prantl, *Pflzfam.*, Nachtr., 1897, 126; Van Tiegh., *Bull. Soc. bot. Fr.* xli, 1894, 261.

Inflorescence cymose or subumbellate. Flowers in triads, the central flower sessile. Buds slightly curved, inflated in the middle and also at the base. Petals 6, abruptly deflexed. Filaments about as long as the very acute anthers. Anther cells very frail. Style capillary, curved or wavy in bud from one side of the corolla to the other. Stigma slightly enlarged. Apex of ovary prismatic in bud, but completely enclosed in the oval or globose fruit. Ovary one-celled. Embryonic cotyledons probably withdrawn from the endosperm when germination takes place. Glabrous, divaricate or sometimes pendulous shrubs, with moderately large, shining, reticulate leaves. Union fusiform, with numerous reddish-brown adventitious roots, the disc of which in the early stage, is thin and oblong-ovate in outline.

36. Loranthus dictyophlebus F. v. M. Plate vi.

Rept. Burdk. Exped., 1860, 14; Benth., *B. Fl.* iii, 1866, 391; Moore and Betche, *Handb. Fl. N.S.W.* 1893, 228; Van Tiegh., *Bull. Soc. bot. Fr.* xli, 1894, 261, as *Amylotheca dictyophleba;* Engler et Prantl, *Pflzfam.*, Nachtr. iii, 1897, 126; Bail., *Bot. Bull.* xvi, 1903, as *L. tenuifolius*, changed to *L. Beauverdianus* Bail., *Com. Cat. Qland Plants*, 465, fig. 449; Bail., *Qland Fl.* Part v, 1902, 1378.

Glabrous; leaves opposite, ovate, oblong or ovate-lanceolate, narrowed into a short petiole, strongly penninerved and netveined, shining above, paler beneath; secondary peduncles few, lateral, usually three-flowered, forming a cymose corymb; lateral flowers short pedicelled; calyx obconical-cylindrical, with a repand margin, three or four times longer than the orbicular bracteole; petals 6, vitellinous, connate into a club-shaped-cylindrical, unilaterally somewhat dehiscent tube; limb in aestivation much narrower than the tube; anthers narrow-linear, basifixed; style capillary; stigma minute, capitate.

Supplementary Notes.

Compact, glabrous shrubs, 2-3 feet in diameter; attachment supported by numerous strong adventitious roots. Branches divaricate, erect, rarely pendulous, the older ones covered with a spongy or corky bark; lenticels minute or totally obscure. Leaves usually dark green, shining above, the veins conspicuous, paler and obscurely veined beneath, broadly elliptical to broadly lanceolate, a few narrow-lanceolate, 7-12 cm. long, tapering into a short petiole. Inflorescence glabrous in all its parts. Peduncles axillary, 1½-2½ cm. long, bearing 3-7 umbellate-divaricate branches, the flowers sometimes single on the short pedicels, but

[1] Since recorded as var. *spathulata*, Ewart and Tovey, *Proc. Roy. Soc. Vic.* xxxii (New Series), 1920, 199.

usually arranged in triads, the central flower of each triad sessile. Flowers somewhat striate, crimson, tipped with green, 4¼ cm. long. Bracts slightly decurrent, narrow-lanceolate, acute, concave, the apex much paler than the base. Calyx obconical, faintly sulcate when dry, the limb truncate, about 1 mm. broad. Buds acute, contracted about 7 mm. below the apex, inflated below the base of the petals. Corolla semitransparent, showing the curvature of the style in the inflated portion. Petals 6, all equal in length, deflexed, narrow-linear, acuminate, 7 mm. long. Filaments shorter than the anthers, the latter somewhat sagittiform, the cells membranous, imbricate around the style after the petals become deflexed, finally separating and becoming contorted after anthesis. Style capillary, tough, resting on the conical apex of the ovary; stigma clavate, rather large. Fruit elliptical to globose, 10 mm. long, changing from buttercup-yellow to deep orange-red, and finally to purple-brown. Endocarp thin, opening apically; seed elliptical, 5-7 mm. long, slightly ridged or furrowed with 6 faint divisions; endosperm light green. Embryo nail-shaped; embryonic cotyledons acute, and apparently articulate on the terete, smooth hypocotyl. Suctoral disc surrounded by numerous rather long green papillae, saturated with copious viscin, and forming a little mop around the head of the hypocotyl. Hypocotyl not cleft; the cotyledons appear to withdraw from the endosperm on germination.

Synonyms.—*Loranthus tenuifolius* Bail., *L. Beauverdiana* Bail., *Amylotheca dictyophleba* (F. v. M.) Engler, *Elytranthe dictyophleba* (F. v. M.) Engler.

Mueller does not say where the type is from. In his Report on the Burdekin Expedition, where the species was first described, he quotes the following localities: Illawarra, Hastings River, Moreton Bay. The latter is probably the type locality, as he collected it there himself. Through the kindness of Professor Ewart, of Melbourne Herbarium, I was able to examine the Hastings River specimen, which is similar to other New South Wales and Queensland specimens.

Range.—This species does not show a great amount of variation, considering its extensive coastal range from Cape York to Kiama, N.S.W. Its range will no doubt be extended further south as the flora is more thoroughly worked.

Affinities.—Mueller (*Rept. Burdk. Exped.*) refers to *L. loniceroides* as having affinity with this species. He says: "The leaves resemble greatly those of *L. loniceroides.* The contracted apex of the alabaster and the inflorescence seem mainly to distinguish our plant." Amongst the Australian species it has no really close affinity; its nearest is *L. Exocarpi* Behr, var. *spatulata*, which approaches it in the colour of the flowers, and in the strongly veined leaves, but *L. dictyophlebus* has a totally different inflorescence, and it also shows marked inequality in its broader leaves, which are relatively more reticulate.

L. vitellinus F. v. M. has often been mistaken for this species, but there is great diversity between the characters of the two species, and therefore the affinity is a superficial one.

Hosts.—Moraceae: *Ficus* sp. Magnoliaceae: *Drimys dipetala* F. v. M. Anonaceae: *Eupomatia laurina* R. Br. Monimaceae: *Doryphora sassafras* Endl. Cunoniaceae: *Ceratopetalum apetalum* D. Don. Lauraceae: *Cryptocarya australis* Benth., *C. microneura* Meissn. Sapindaceae: *Cupaniopsis anacardioides* Radk. Myrtaceae: *Backhousia sciadophora* F. v. M., *Eugenia Smithii* Poir.

Ser. Eudendropiithoe Endl.

Endl., Gen., 1839, 802; Engler, Engl. et Prantl, *Pflzfam.*, Nachtr., 1897, 129.

Flowers in pairs, racemes, or in axillary clusters, glabrous or pubescent, 5-, rarely constantly 6-merous, subtended by a small pedicellate bract, which enlarges

somewhat as the fruit develops. Calyx cupular, truncate, or irregularly dentate. Corolla curved, and usually inflated in the middle; segments linear, lanceolate; the inermis filaments longer or shorter than the anthers. Anthers linear-lanceolate, basifixed. Fruit subglobose, ovate or urceolate. Leaves well developed, penninerved. Adventitious roots usually present on young plants. Union ball-like on smooth-barked trees, fusiform on trees with a persistent rough bark, and invariably supported by adventitious roots when parasitic on the latter.

37. Loranthus acacioides (A. Cunn.) Benth. Plate vii.

Benth., *B. Fl.* iii, 1866, 392.

Glabrous with slender branches. Leaves alternate, oblong or lanceolate, obtuse, narrowed into the petiole, rarely above 2 inches long, rather thin and often 3-nerved. Peduncles axillary, solitary or in pairs, short and slender, reflexed, each with two flowers, on short slender pedicels. Calyx-limb prominent, truncate or sinuate, toothed. Petals not quite one inch long, united to about ¾ of their length into a slightly dilated tube. Anthers adnate, narrow linear.

Supplementary Notes to the Description.

Flowers bright red or orange-red; buds 3 cm. long. Corolla very thin; the slightly raised adhering portion of the filaments gives it a striate appearance, and a resemblance to *L. vitellinus*. Petals sometimes faintly trinerved inside. Anthers yellowish, 3 mm. long, with membranous-like margins. Filaments bent at the base of the anthers. Style yellow, wavy in bud, or bent from one side of the corolla to the other, straightening out on maturity, and exceeding the anthers by 3-4 mm. Stigma reddish, small, conical. Fruit orange-red or scarlet, somewhat urceolate, 5-8 mm. long; cotyledons not seen.

Synonym.—Elytranthe acacioides (A. Cunn.) Engler.

The type is probably from the Northern Territory or from the north-west coast of Western Australia. Robert Heward, in his biographical sketch of the late Allan Cunningham (p. 30), includes it amongst the plants from York Sound, Capstain Island, and Montagu Island, collected by Allan Cunningham, August, 1820. These localities are south of the Cambridge Gulf.

Range.—Northern Territory: Victoria and Fitzmaurice Rivers. *Western Australia*: Durack River; Derby, West Kimberley (on *Adansonia Gregori*, *Acacia sericata*, *A. flavescens*); Goody Goody; Lennard River (on *Cochlospermum heteronemum*); Barker River, near Lower King Edward River.

Affinities.—Its nearest affinity is *L. Exocarpi*, from which it differs in the alternate, narrow to broad lanceolate, pale-coloured, thin leaves, and in the frailer and longer common peduncle, which supports 1-3 flowers. It also bears a strong resemblance to the small leaved forms of *L. vitellinus*, in the shape, colour, and venation, and, to some extent, in the shape of the fruit; but the ramifications of the inflorescence are totally different in *L. vitellinus*.

Hosts.—Leguminosae: *Acacia flavescens* A. Cunn., *A. sericata* A. Cunn. Bombaceae: *Adansonia Gregori* F. v. M. Bixaceae: *Cochlospermum heteronemum* F. v. M.

38. Loranthus homoplasticus, n. sp. Plate viii.

Frutex glaber ramis tenuibus glaucis compressis apud nodos latioribus lenticulis. Folia opposita glauca sessilia late-cordata amplexicaulia 2-5 × 2-4 cm. Racemi tenues rhachide 1½ cm. longi, 3-8 flores praebentes. Flores breviter

pedicellati flavo-pruinosi 3 cm. longi superiores ultra folia exstantes. Bracteae cordatae vel orbiculares concavae 1 mm. Gemmae robustae arcuatae 30 mm. Calyx cylindricus lamina truncata 3 mm. Corolla tubo striato, petalis 5 crassioribus deflexis margine interiore lacerato. Filamenta compressa, antheris brevioribus adnatis linearibus 4-5 mm. Stylus angularis 3 mm. longior antheris coronatis stigmate conico obtuso. Fructus glaucus urceolatus 10 mm. nondum maturus.

Glabrous shrubs, branches slender, glaucous, compressed and broader at the nodes; lenticels obscure; leaves glaucous, sessile, opposite, broadly cordate, amplexicaul, 2-5 × 2-4 cm.; venation reticulate, median nerve distinct beneath. Racemes slender, the rhachis 1½ cm. long, 3—8-flowered; flowers shortly pedicellate, pruinose, yellow, 3 cm. long, exceeding the small upper leaves, but usually enclosed in the larger leaves; bracts cordate to orbicular, concave, 1 mm. long; calyx cylindrical with a rather prominent, truncate limb, 3 mm. long; buds robust, arcuate, 30 mm. long, gibbose at the point of attachment of the filaments; corolla-tube striate, petals 5, rather thick, deflexed, linear-lanceolate, 7-8 mm. long, the inner margins bordered by a small, lacerated fringe; anthers adnate, linear, 4-5 mm. long, slightly shorter than the compressed filaments; style angular, exceeding the anthers by about 3 mm., crowned by a rather large, obtuse, conical stigma; fruit glaucous, urceolate, the limb conspicuous, 10 mm. long, but not seen in a ripe state.

Synonym.—*L. longiflorus* Desr., var. *amplexifolius* Benth., *B. Fl.* iii, 1866, 390, but not of De Candolle, nor Thwaites; Bail. *Synop. Qland Fl.* 1883, 450, as *L. longiflorus* Desr., var. *amplexifolius* Benth.

Bentham (*l. c.*) refers to this plant as follows: "Leaves sessile, orbicular cordate. The specimens are fragmentary and do not show whether this be a distinct var. or only a form of leaf assumed at a particular age, or on some branches only."

It seems to me that Bentham had doubts about it being the same as *L. amplexifolius* DC. (*Prod. Syst. Veg.* iv, 1830, 305;. Wight and Arn. Prod. 384; Ic. Fig. 301) which Thwaites (*Enum. Cey. Pls.*, 134) reduced to a variety of *longiflorus* Desr.

L. homoplasticus appears to differ from *L. amplexifolius* DC. in the following characters: Glaucous throughout; leaves smaller; racemes axillary (not terminal), shorter, with fewer flowers; buds shorter and stouter; flowers yellow or reddish (not purple); filaments without barbs; stigma larger; fruit urceolate, glaucous.

The leaves of *L. homoplasticus* bear a striking resemblance to the leaves of *Eucalyptus pulverulenta*, *E. cordata*, *E. melanophloia*, and *E. Krauseana*, hence the specific name.

Range.—*Queensland*: Cooper's Creek; Banks of the Mackenzie, near its junction with Comet Creek; Irwinbank; Stannary Hills (Dr. T. L. Bancroft, the type); Gulf of Carpentaria. (A few of the leaves on this specimen are alternate.) *Northern Territory*: Arnheim's Land.

Affinities.—Its nearest affinity is *L. vitellinus* F. v. M.; the flowers are somewhat similar, but the leaves sharply separate them. To *L. Benthami*, it is allied in the leaves; the inflorescence is, however, very dissimilar, which places it in a different section. Amongst the exotic species *L. amplexifolius* DC. is its nearest affinity.

Host.—*Eucalyptus alba* Reinw.

39. Loranthus vitellinus F. v. M. Plate ix.

Rept. Burdk. Exped., 1860, 12; *B. Fl.* iii, 390, as *L. longiflorus;* Ettingsh. *Über die Blatts. der Lor.* Tab. xii, fig. 3, as *L. coriacea* A. Cunn.; Britt. *Ill. Cook's Voy.* iii, 86, fig. 274 (in part) as *L. longiflorus;* Bail., *Fl. Qland*, v, 1378.

The following is the original description: Leaves alternate or some opposite, petioled, ovate or lanceolate, or oblong-ovate, rarely oblong-lanceolate, glabrous, opaque, somewhat penninerved, almost veinless; peduncles bearing a few-flowered raceme, rarely 1-3 flowered, sometimes obliterated, as well as the pedicels; bracteoles and calyces subvelutinous or glabrous; bracteoles solitary, roundish-ovate, considerably shorter than the toothless or at least irregularly 5-toothed calyx; petals 5, glabrous, rarely tomentose, orange-yellow, coherent into a cylindrical, curved, unilateral fissured tube; limb in aestivation narrower than the tube; filaments glabrous, fulvous; anthers linear, basifixed; stigma small, capitellate; berry truncate, globose-ovate.

Branches pendulous, cylindrical. Leaves 1½-3 inches long, 4-16, rarely only 2, lines broad, tapering into a long or short petiole, rarely subsessile. Pedicels 1-4, rarely 6, lines long, clothed, as well as the bracteoles and calyces, with a brown or grey velvet. Calyx 2-3 lines long, with a conspicuous limb. Bracteoles about 1 line long, sometimes acute. Corolla 1-1¾ inch long, with an orange-coloured tube and a red limb, not distinctly gibbous, although curved and slightly dilated below the limb; one of the lobes usually deeply separated. Anthers yellow, 1-3 lines long. Style thinly angular-filiform, longer than the corolla. Berry 3-4 lines long.

It will be seen from the description that more than one species is involved and apparently it includes *L. odontocalyx*, which Mueller regarded as a variety of *L. vitellinus*, and which was raised to specific rank by Bentham, who gave Mueller credit for it (vide *B. Fl. l. c.*). At the same time he suppressed Mueller's *L. vitellinus* as being conspecific with *L. longiflorus* Desr., an Indian-Ceylon plant, which is distinct from the Australian plant.

Through the kindness of Mr. J. H. Maiden, I was able to obtain from the Curator, Calcutta Herbarium, specimens of the Indian and Ceylon plants. After a careful investigation of the specimens I found that they represented three well marked forms of *L. longiflorus* Desr., viz.: (1) Strictly glabrous; leaves opposite or alternate, broadly oval-oblong, or oblong-lanceolate, shortly petiolate; filaments barbed. (2) The same as (1), but the filaments not barbed. (3) Leaves the same as in (1); young shoots and inflorescence hoary-pubescent; filaments barbed. The first appears to be the typical *L. longiflorus* Desr. (vide Wight, *Fl. Ind. Ori.* vi, 384, fig. 302). It seems to be quite glabrous with broadish leaves.

The flowers vary from 1-2½ inches long, with barbed filaments (vide Wight's fig. 302, *l.c.*). None of the specimens of *L. vitellinus* agrees with the foregoing. There are, however, three forms of the species that I have examined in conjunction with the Indian-Ceylon forms of *L. longiflorus*, viz.:

(A). Strictly glabrous with narrow oblong, lanceolate-falcate leaves tapering at both ends and particularly into a long terete petiole. Flowers 5-15 in the raceme.

(B). Young shoots, buds and pedicels rufous-pubescent; pedicels short and stout. Flowers 5-20 in the raceme, or usually 7-15.

(C). Young shoots, buds and pedicels hoary-pubescent; pedicels slender, bracts rather large. Flowers 3-9 in the raceme = *L. odontocalyx* F. v. M.

The leaves of (B) and (C) appear to be more variable than those of (A), ranging from obovate, with short petioles, to narrow oblong, or narrow lanceolate

with long petioles. (A) is the nearest approach to the Indian form (2), which is without deflexed hairs to the filaments, but the Australian plant has smaller and narrower leaves, with long terete petioles. All the Indian-Ceylon specimens that I have seen have broad leaves with a remarkable, short, thick petiole. It will be noted that the Australian specimens of this series are the reverse; the flowers are also smaller, and the calyces sometimes deeply toothed; and the filaments are always longer than the anthers. Forms (B) and (C) are pubescent, and to some extent resemble the Indian form (3). The leaves, however, are not the same; they are thinner, larger and broader, also more sessile in (3), and the filaments are barbed, while the calyx is also more truncate.

It appears to me that Bentham, in reviewing the whole of the forms, was impressed with the great similarity existing between the Indian and Australian specimens, and I am inclined to believe that the pubescent forms led him to look upon the Australian plant as being conspecific with the Indian plant, when he suppressed *L. vitellinus* F. v. M.

His description of *L. longiflorus* in the Flora (*l. c.*) includes all its forms; these forms, omitting the var. *amplexifolius*, have alternate leaves. It is rarely that examples of opposite leaves are met with; they occur sometimes, and to a very limited extent on young shoots, but ultimately become alternate; occasionally opposite leaves appear at the junction of two or more branches in some specimens. Both, however, are isolated cases.

The filaments of all the Australian plants are free from barbs or deflexed hairs, and they are as long as, or longer, than the anthers.

Kurz (*Forest Flora British Burma*, ii, 321) refers to the style of *L. longiflorus* as being 5-sided. Keeble states that the style of the Ceylon *L. longiflorus* is bent from one side of the corolla to the other. In *L. vitellinus* the style is very slender, and more terete than angular, and is only slightly curved in bud, but not bent from one side of the corolla to the other, as is common in *L. acacioides* Cunn. I therefore agree with Mueller, that, notwithstanding the peculiar similarity of *L. vitellinus* F. v. M. to *L. longiflorus* Desr., it is nevertheless distinct, and I feel justified in excluding *L. longiflorus* Desr. from the Australian Loranthaceae, and in restoring *L. vitellinus* F. v. M. as a valid species.

As already indicated, *L. vitellinus* is a composite species, and in order to ascertain what Mueller meant by his species, it is necessary to examine the specimens labelled *L. vitellinus* by him. They are as follows:

(1) Victoria River, F. Mueller, Oct., 1855. The young shoots and calyces are hoary pubescent. (2) Glencoe Station, Port Darwin, Nicholas Holtze. This is almost identical with (1). (3) Arnheim's Land, N. Holtze, 1892. With the same characters as the preceding. (4) *L. vitellinus* Ferd. Mueller, var. *odontocalyx* F. Mueller, on *Grevillea chrysodendron*. Towards McAdam's Range and Providence Hill, F. Mueller, Oct., 1855, with the following note, probably in Bentham's handwriting: "This is a cymose inflorescence, not racemose as in *vitellinus*." (5) *L. vitellinus*, var. *odontocalyx*, Arnheim's Land, F. Mueller. The same as (4), both being hoary-pubescent, and fragmentary. These constitute the type of *L. vitellinus* F. v. M., var. *odontocalyx* F. v. M. (*L. odontocalyx* F. v. M. of Bentham *l. c.*). (6) Archer's Station, Dr. Leichhardt, Nov. 23rd, 1843. The leaves of this specimen are narrow to broadly lanceolate, 2-5 inches long; young shoots and inflorescence rusty-pubescent. (7) Clarence River, Beckler. It has the same characteristic indumentum as (6).

Numbers 1 to 5 are all forms of one species, and are all more or less covered with a hoary vestiture, particularly the young shoots and inflorescence. Numbers 4 and 5 of this series are fragmentary and depauperate forms of the same species. The leaves are smaller in 4 and 5, but they are undeveloped and can be easily matched with the half-developed leaves of the series. Numbers 4 and 5 constitute the type of *L. odontocalyx* F. v. M., and as 1, 2 and 3 are almost inseparable from them, they appear to belong to the imperfectly known *L. odontocalyx* F. v. M. It is common in the north of the continent, but does not appear to extend further southwards than Rockhampton, in Queensland.

Numbers 6 and 7 have a totally different vestiture, and they also differ in other characters, but in the colour of the vestiture alone they are sharply separated. This form is most common in the Port Jackson district, and extends to North Queensland. It is quite possible that Mueller first received it from a New South Wales locality. As already indicated, Mueller looked upon the hoary plant as a variety of *L. vitellinus*, and it is quite probable that the rufous-pubescent, and glabrous plants were regarded by him as *L. vitellinus*. The same view was evidently taken by Bentham, for, in his description of *L. odontocalyx* he particularly mentioned the hoary vestiture of the plant. As the hoary-pubescent plant appears to find its natural position under *L. odontocalyx*, therefore, the rufous-pubescent plant represented by Nos. 6 and 7 can, without doubt, be looked upon as constituting *L. vitellinus* F. v. M.

Additional Notes to the Description.

Small glaucous shrubs with short, divaricate or pendulous, glabrous branches; the nascent parts and inflorescence infested with a minute, rufous or ferruginous tomentum; lenticels numerous, usually orbicular; attachment or union, an irregular fusiform swelling, though somewhat ball-like on smooth-barked trees; adventitious roots usually present, or occasionally absent when the union is ball-like, rarely longer than the branches; leaves narrow to broad lanceolate, occasionally ovate, thick and venulose, the veins more prominent on the upper surface; petioles usually short and thick, terete or compressed; racemes ¼-2 inches long, pedicels short, and considerably thicker than those of *L. odontocalyx*, densely rusty or rufous-pubescent, particularly when half-grown; buds rufous-pubescent, rather stout, acute, slightly angular at the top, the tube more terete, 1-1¼ inch long; corolla yolk-yellow shading to Indian-red; petals carthamnus-red shading to tomato-red; anthers narrow, lemon-yellow, 5 mm. long; filaments compressed and gradually narrowed upwards; style slightly bent in bud, exceeding the anthers by 1-2 mm., the upper portion reddish, or usually the same colour as the petals, terete throughout when fresh, but somewhat angular when dry; fruit oval-oblong to flask-shaped, 10-15 mm. long, 5-6 mm. in diameter, usually apricot-yellow at the base, shading into reddish-old-rose at the top; disc pentagonal; seed usually issuing from the base of the pericarp, oblong, 6-8 mm. long, resting upon a rather large, white, non-viscid, spongy base, from which arise 5 small, linear, acute appendages which project a little beyond the endosperm, giving the freshly released seed a dentate appearance; viscin copious, very sweet; endosperm green; embryo clavate, 4-5 mm. long; suctoral disc domed, quite smooth, about 2½ mm. in diameter before germination takes place; cotyledons linear, acute.

Remarks.—The flowering period of *L. vitellinus* is from August to January. In the Sydney district it is seen at its best in November, and is then a favourite food-plant of many birds. The following were observed by me feeding upon the

nectar: Spinebill, *Acanthorhyncha tenuirostris;* Tawny-crowned Honey-eater, *Gliciphila melanops;* Sanguineous Honey-eater, *Myzomela sanguinolenta;* Singing honey-eater, *Ptilotis sonora;* White-bearded Honey-eater, *Meliornis novaehollandiae;* and White-eye, *Zosterops coerulescens.*

In the Hornsby district *L. vitellinus* is very destructive to the young Bloodwoods, *Eucalyptus corymbosa*; it attacks the young plants when only 3-6 feet high, and many young saplings are completely decrowned by the parasite, which continues to grow for several years after the green top of the host succumbs to the ravages of the Loranthus. The plants are very upright in habit and the branches strong and thick when attached to hosts that allow plenty of air and sunlight, but on hosts that are densely foliaged the branches are usually long and pendulous. It is common to see it growing from the topmost branch of the highest Bloodwoods or from *Eucalyptus eximia, E. haemastoma, E. micrantha,* and *Angophora lanceolata;* whilst on *Angophora intermedia* it forms dense drooping masses, in company with *Phrygilanthus eucalyptifolius.* In the settled districts where the native flora has been destroyed it has adapted itself to the exotic vegetation, and is more or less a pest in many large gardens and orchards around Sydney and suburbs.

F. M. Bailey (*Weeds and Suspected Poisonous Plants of Queensland,* 178, under *L. longiflorus* Desr.) suggests that it should be classed as a noxious weed.

Synonyms.—*L. coriacea* A. Cunn. MSS., *L. longiflorus* Benth., *non* Desr.

Range.—This species has a wide coastal range, extending from Genoa in Victoria to the Endeavour River in North Queensland, and is known from Goose Hill, near Ord River, in Western Australia.

Affinities.—*L. odontocalyx* F. v. M. is its nearest affinity, and it can be distinguished from this by the rufous-pubescent vestiture of the nascent parts, young buds and calyces, also in the less denticulate calyx-limb; the rhachis and pedicels are also considerably thicker when in fruit, and the fruit smaller than *L. odontocalyx. L. Loheri* Merr., from the Philippine Islands, is remarkably like the small-flowered forms of *L. vitellinus.* It is, however, more delicate in all its parts and more glabrous than the latter. *L. acacioides* A. Cunn., somewhat resembles *L. vitellinus* in the shape and colour of the buds; and the coarse-leaved forms of the former are apt to be confused with the latter when other botanical characters are absent.

Mueller states that "*L. vitellinus* approaches closely to *L. longiflorus* Desr., according to plate 302 of Wight's *Icones Plant. Ind. Orient.* and a specimen collected in Khasia by Drs. Hooker and Thomson; the leaves we find smaller, the flowers often shorter, with a limb before expansion gradually tapering to the apex, and thereby subulate-conical, rarely turgid, and the stamens are smooth."

Hosts.—Casuarineae: *Casuarina suberosa* Ott. and Diet., *C. torulosa* Ait. Salicineae: *Populus alba* L., *Salix Babylonica* L. Betulaceae: *Quercus pedunculata* L. Platanaceae: *Platanus orientalis* L. Proteaceae: *Grevillea robusta* A. Cunn., *Hakea dactyloides* Cav., *Persoonia linearis* R. Br. Loranthaceae: *Loranthus congener* Sieb., *L. ferruginiflorus* W. V. Fitz., *L. Miquelii* Lehm., *L. pendulus* Sieb., *Phrygilanthus celastroides* (Sieb.) Eichl., *P. eucalyptifolius* (Sieb.) Engler. Santalaceae: *Exocarpus cupressiformis* Labill. Rosaceae: *Cydonia vulgaris* L., *Pyrus malus* L. Leguminosae: *Acacia decurrens* Willd., var. *normalis* Benth., and var. *mollis* Benth., *A. armata* R. Br., *A. pauciglandulosa* F. v. M., *Cytisus proliferus* L. var. *palmensis* Christ. Rutaceae: *Citrus Limonum* L., *Geijera parviflora* Lindl. Meliaceae: *Melia Azedarach* L., *M. Candollea* Juss., *Cedrela toona*

Roxb., var. *australis* C. DC. Anacardiaceae: *Schinus molle* L. Sterculiaceae: *Brachychiton populneus* R. Br. Myrtaceae: *Eucalyptus acmenioides* Schau., *E. Baileyana* F. v. M., *E. calophylla* R. Br., *E. corymbosa* Sm., *E. eximia* Schau., *E. haemastoma* Sm., *E. micrantha* DC., *E. maculata* Hook., *E. maculosa* R. T. Baker, *E. notabilis* Maiden, *E. Nowraensis* Maiden, *E. robusta* Sm., *E. Shiressii* Maiden and Blakely, *E. umbra* R. T. Baker, *E. viminalis* Labill., *E. obtusiflora* DC., *E. paniculata* Sm., *E. piperita* Sm., *E. punctata* DC., *E. rubida* Deane and Maiden, *Angophora Bakeri* Hall, *A. cordifolia* Cav., *A. intermedia* DC., *A. lanceolata* Cav., *A. ochrophylla* R. T. Baker, *A. subvelutina* F. v. M., *Tristania laurina* R. Br., *T. neriifolia* R. Br., *T. suaveolens* Sm., *Callistemon lanceolatus* DC., *C. linearis* DC., *C. rigidus* R. Br., *C. viminalis* Cheel, *Leptospermum attenuatum* Sm., *L. flavescens* Sm., *L. floribundum* Salisb., *Melaleuca Leucadendron* L., var. *albida* Sieb., *M. nodosa* Sm., *M. genistifolia* Sm., *M. lineariifolia* Sm., *M. styphelioides* Sm., *Kunzea corifolia* Reichb.

Var. GLABRESCENS, n. var. Plate x.

Omnino glaber. Rami plerumque penduli glabri nitentes vix lenticulares. Folia sub-glauca angusti-lanceolata falcata vel plerumque angusti-oblonga. Petiole longa 5-20 cm. longa. Racemi 2½-5 cm., 7-15 floribus glabris simillibus eis typicae. Calyx nonnumquam acriter denticulatus.

Glabrous in all its parts; branches usually pendulous, often smooth and shining, scarcely lenticulate; leaves somewhat glaucous, usually narrow-lanceolate, falcate to narrow-oblong, rarely broadly oblong, tapering into a terete, often long petiole, 2-8 inches long. Racemes 1-2 inches long, bearing 7-15 glabrous flowers, which scarcely differ from the typical form; calyx sometimes deeply toothed.

Range.—It will be seen that this variety appears to have originated in the north of the continent and gradually spread southwards as far as Narrabri. *New South Wales*: Moema State Forest, Narrabri (on *Eremocitrus glauca* and *Acacia* sp. The union is similar to the typical form showing adventitious roots with caterpillar-like haustoria beneath them); Inverell (on *Magnolia grandiflora*); Terry Hie-Hie; Moree; Warrah; Liverpool Plains (on *Brachychiton populneus*); Wallangarra (on *Angophora* sp.). *Queensland*: Mt. Perry; Eidsvold (on *Eucalyptus melanophloia*); Knockbreak Station (on *Euc. crebra*, *Schinus molle*); Rockhampton (on *Euc. terminalis*, *E. alba*, J. H. Maiden, 3, 1909, the type); Port Mackay (on *Melaleuca Leucadendron* var. *saligna.*); Prairie, 30 miles east of Hughenden (on *Euc. microtheca*); Thirsty Sound (Banks and Solander, 1770, ex Herbario Musei Brittannica in part); Thursday Island. *Northern Territory*: Borroloola.

Hosts.—Magnoliaceae: *Magnolia grandiflora.* Rutaceae: *Eremocitrus glauca* Swingl. Leguminosae: *Acacia* sp. Sterculiaceae: *Brachychiton populneus* R. Br. Myrtaceae: *Euc. alba* Reinw., *E. crebra* F. v. M., *E. microtheca* F. v. M., *E. melanophloia* F. v. M., *E. terminalis* F. v. M., *Angophora* sp., *Melaleuca Leucadendron* L. var. *saligna* Bail.

40. LORANTHUS ODONTOCALYX F. Muell. (Herb.). Plate xi.

Benth., *B. Fl.* iii, 391; Bail. *Qland Fl.* v, 1379.

Glabrous, except the inflorescence, or slightly hoary-tomentose. Leaves mostly alternate, oblong, cuneate-oblong or lanceolate, obtuse, narrowed into a short petiole, under 3 inches long, thick and scarcely veined. Cymes axillary, sessile or very shortly pedunculate, usually 3- to 7-flowered, the short branches and pedicels

hoary-tomentose as well as the buds. Calyx tomentose, the limb more prominent than in the allied species, nearly as long as the adnate tube, 5-toothed. Petals 5, not quite 1 inch long, united to above the middle. Anthers adnate linear. Young fruits crowned by a long neck formed by the calyx-limb.

Professor Ewart, of Melbourne Herbarium, kindly donated to the National Herbarium, Sydney, portion of the type, and he afterwards submitted the remainder, and a specimen from Arnheim's Land, for investigation. The type is rather fragmentary and consists of a few small branchlets, loose leaves, buds, and an imperfect raceme. The branchlets are somewhat rough, partly owing to numerous minute lenticels. Leaves opposite and alternate, narrow lanceolate, dull or glaucous-looking, penninerved, 1½ to 3 inches long. Buds slender, hoary pubescent, curved, 20 mm. long, but not fully developed. Pedicels slender, about the length of the calyx, hoary, as well as the rather deeply toothed calyx. Bracts hoary, broad, acute, embracing the base of the calyx.

The type is without a doubt a depauperate specimen, and owing to the impoverishment of the plant, the inflorescence is greatly reduced; in fact, it is immature. The specimen from Howick Group, F. Mueller, quoted by Bentham under this species, has the cymose inflorescence peculiar to *L. pendulus* and its allies, which agrees with *L. Betchei*. Although Bentham regards this specimen with some doubt as belonging to *L. odontocalyx*, its general appearance probably led him to place it with *L. odontocalyx*.

Professor W. Baldwin Spencer collected a well grown specimen near Darwin, Northern Territory, 1911-12, which at first impressed me as being a rather long pedicellate form, but when compared with the type, especially the young shoots and undeveloped buds and calyces, I was convinced that it represented a more normal example of what the species might attain to, and that the material used in the original description was immature and imperfect.

The following is a description of Professor W. Baldwin Spencer's specimen, which is undoubtedly this species: Branches long and slender, the young one hoary-lepidote, lenticulate; lenticels orbicular, rufous; leaves oblong, obtuse, or oblong-lanceolate, 1½-4 inches long, ¼ to 1 inch broad, the median nerve and petiole reddish-brown, lateral veins numerous, arising at an angle of about 45°; racemes in pairs, shorter than the leaves, 3—7-flowered, with sometimes a solitary pedicellate flower at the base of the raceme, but quite free from it; flowers on slender pedicels 6-8 mm. long; bracts broad, cordate, acute, at first hoary, eventually becoming quite glabrous and sometimes greenish as they mature, slightly larger than those of *L. vitellinus*; calyx 4.5 mm. long in the newly expanded flower, cylindrical, and densely hoary-pubescent, denticulate or irregularly 5—6-toothed; young buds hoary, yellowish when mature, slightly curved, inflated for about ¾ of their length into a dilated tube, the upper portion more slender and uniformly terete, ending in a rather acute point. Corolla yellowish, cleft, to a little below the base of the free portion of the filaments, into 5, rarely 6, narrow, linear, acute, deflexed segments, somewhat tomentose inside; filaments narrow, shorter than the anthers, the same colour as the corolla; anthers narrow-linear, adnate, 5-7 mm. long; style slender, faintly angular; stigma capitate, larger than in *L. vitellinus*. Fruit 10-18 mm. long, oblong-urceolate, hoary, except the persistent calyx limb.

The mode of attachment has not been stated by any of the collectors. Its cotyledons are also unknown.

The history of this species has been dealt with under *L. vitellinus*, together with some of the Northern Territory specimens, which I regard as being almost typical of the species.

Range.—*Northern Territory*: McAdam's Range and Providence Hill (on *Grevillea chrysodendron*, the type); Victoria River (on *Eucalyptus* sp.) Glencoe Station, Port Darwin; Arnheim's Land. *Queensland*: Islands of the Gulf of Carpentaria; Gilbert River; Cairns; Mitchell River (on *Acacia Bidwilli*).

Affinity.—It is closely allied to *L. vitellinus*, from which it is readily distinguished by the hoary vestiture of the young buds, and the more slender pedicels, the uniformly toothed calyx, and larger and more tomentose fruit.

Hosts.—Proteaceae: *Grevillea chrysodendron* R. Br. Leguminosae: *Acacia Bidwilli* Benth. Myrtaceae: *Eucalyptus* sp.

Var. PROPRIA Blakely.

Proc. Roy. Soc. Qland, xxxix, 1922, 28.

Vestimentum surculorum juvenilium atque inflorescentiae minute rufo-cinereum. Folia macra plerumque late lanceolata, 5-10 cm. longa, 2-5 cm. lata, petiolata; petiolare 1-2 cm. longae.

Vestiture of the young shoots and inflorescence rufous-cinereous. Leaves thin, usually broadly lanceolate, 5-10 cm. long, 2-5 cm. broad, petiolate; petioles 1-2 cm. long.

Inflorescence and structure of the flower the same as in *L. odontocalyx*, but the calyx is often entire and sometimes split on one side. The corolla is also glabrous inside, a character which brings it nearer to *L. vitellinus*, but the vestiture and the slender pedicels, together with the thin leaves, and also in some cases fewer flowers in the raceme, point to it being a form of *L. odontocalyx*. It is best described as being intermediate between *L. odontocalyx* and *L. vitellinus*, as it possesses some of the characters of each. The typical *L. odontocalyx* has a hoary vestiture, whilst that of *L. vitellinus* is ferruginous, and the vestiture of var. *propria* is partly both. It was first described from specimens from Yule Island, Papua (C. T. White, No. 736, July-August, 1918). The Australian plant does not appear to differ in any way from the Papuan plant.

Range.—Dunk Island; Kuranda (Leaves not unlike those of *Ligustrum lucidum*, shining above, pale beneath.); Cairns; Innisfail.

Ser. BENTHAMINA Engl.

Engl. et Prantl, *Pflzfam.* Nachtr. ii, iv, 1897, 132; genus *Benthamina* Van Tiegh., *Bull. Soc. bot. France*, xlii, 1895, 246.

Flowers binate, ferruginous, on short ferruginous, bracteate pedicels, rarely longer than the calyx. Buds straight or arcuate, clavate, inflated in the middle, contracted at the base. Corolla cleft to a little below the middle, but sometimes nearly to the base on one side only. Petals very short, rather broad, spreading or deflexed. Filaments and anthers about the same length. Style very slender; stigma not large. Fruit urceolate, ferruginous. Compact shrubs, with closely matted adventitious roots. Branches short, divaricate. Leaves obovate to elliptical, with a spreading, somewhat obscure, venation.

41. LORANTHUS ALYXIFOLIUS F. v. M. Plate xii.

Rept. Burdk. Exped., 1860, 13, as *L. maytenifolius;* Benth., *B. Fl.* iii, 1866, 391; Van Tiegh., *Bull. Soc. bot. France*, xlii, 1895, 246; Engler, Engl. et Prantl, *Pflzfam.* Nachtr. ii, iv, 1897, 132; Bail., *Qland Fl.* v, 1902, 1379.

Leaves opposite, broad or orbicular-ovate, tapering into a very short petiole, faintly or indistinctly nerved and veined, very shining above; peduncles solitary

or geminate, usually 2—3-flowered, as well as the pedicels very short or obliterated, and together with the bracteoles and calyces thinly covered with brown-velvet down; calyx twice as long as the roundish bracteole; its limb minutely denticulated; petals 5, red, coherent into a long, slender, unilaterally dehiscent tube; limb in aestivation broader than the tube and blunt; its lobes narrow-lanceolate, short, inside yellow, outside slightly velutinous; free part of the filaments short; anthers linear, basifixed; style capillar-filiform; stigma minute, capitellate; berry urceolate ovate. Branchlets terete, not unfrequently verticillate. Leaves 1-2 inches long, above dark green, beneath less shining, in age at the margin somewhat recurved. Flowers terminal and axillary, crowded into irregular whorls. Corolla about 1½ inches long, more or less curved, outside slightly silky-downy, especially its limb, lobes hardly 3 lines long. Anthers measuring 1-1½ lines in length. Style short exserted. Ripe fruit unknown.

The following is a more detailed description: Compact shrubs with closely matted adventitious roots, and short divaricate smooth branches, forming dense masses, 2-5 feet in diameter; lenticels conspicuous. Leaves coriaceous, smooth and shining above, often dull and rust-coloured beneath, petioles compressed. Flowers a brilliant scarlet, almost glabrous, in pairs, on short ferruginous pedicels, rarely longer than the calyx, or forming clusters of 3-6 in and around the axils of the leaves or nodes of the branches. Bracts rusty-tomentose as well as the calyx, ovate-cordate, concave, minutely ciliate, about 3 mm. long. Calyx cylindrical, 4 mm. long, the limb conspicuous and ciliate. Buds terete, slender, curved, slightly swollen in the middle, clavate. Corolla striate, cylindrical for about ¾ of its length, then inflated to a diameter greater than that of the base, 3-4 cm. long, separating to within 3-4 mm. of the calyx on the upper side only. Petals 5 or 6, narrow, spathulate, reflexed, somewhat gibbose on the back, the apex acute, incurved, 5 mm. long, exceeding the anthers by about 2 mm. Filaments sometimes shorter than the anthers, but usually about the same length. Anthers adnate, oblong-linear, reflexed with the petals. Style very slender, capillary, imperfectly 4-angled, flexuose in bud, and sometimes the bent central portion will be seen protruding through the cleft in the centre of the corolla before the petals separate; stigma minute, capitate; disc distinctly raised around the base of the style into a thickened ring. Fruit elliptical, oblong, 8 mm. long, but not seen ripe, crowned by the persistent calyx limb. Cotyledons unknown.

Synonym.—*L. maytenifolius* F. v. M., *non* Gray.

Mueller quotes several localities but does not state which specimen constitutes the type. There is a specimen in the Melbourne Herbarium labelled in Mueller's handwriting, from Brisbane, without collector's name or date. It is probably Hill's specimen. Mueller very often omitted the collector's name and date from his labels. The specimen referred to does not differ in any way from those collected from other Queensland localities; it is also similar to the New South Wales specimens.

Range.—This species is a strictly coastal one, and from its range, as we know it at present, it appears to be confined to a limited area, extending from Moreton Bay in Queensland to the Hastings River in New South Wales.

Affinities.—Its nearest affinity is with *L. dictyophlebus*, from which it is distinguished by the smaller and less reticulate leaves, and in the rusty tomentose flowers.

In the leaves it is almost inseparable from *L. Whiteii*, but the connate petals are very dissimilar from the free petals of *L. Whiteii;* the buds of the latter are also more robust and clavate.

When not in flower, one is struck with the marked similarity of *Phrygilanthus celastroides* to this species, and the leaves of the former could very easily be mistaken for those of *L. alyxifolius*.

Hosts.—Salicaceae: *Salix babylonica* L. Moraceae: *Ficus* sp. Casuarineae: *Casuarina suberosa* Ott. and Diet. Monimaceae: *Daphnandra micrantha* Benth. Sapindaceae: *Guioa semiglauca* Radk.

Doubtful Species.

Van Tieghem (*Bull. Soc. bot. France*, xlii, 1895, 83), recorded the following species for Australia: *Loranthus tenuifolius* Van Tiegh. (*non* Engler, *non* Bailey), *L. Muellerianus* Van Tiegh., *L. Muelleri* Van Tiegh., *L. Leschenaultii* Van Tiegh., *L. Kingianus* Van Tiegh. (*non* Engler), *L. brevipes* Van Tiegh., *L. vittatus* (R. Br.), *ex* Van Tiegh. (*non* Engler).

I have endeavoured to procure a copy of the above publication but without success. I also applied to Professor Le Comte, Professor of Botany, Muséum D'Histoire Naturelle Botanique Phanérogamie, Paris, through Mr. Maiden, for the loan of Van Tieghem's types, and also for a copy of the descriptions of his species quoted above. Professor Le Comte replied that Van Tieghem had no types and that he did not leave a description of any of the species on record, so far as he was aware. It appears that Van Tieghem published the names only of his new species under his new classification.

As I have not had the facilities for thoroughly investigating the above species, I very reluctantly place them aside as doubtful species, but I shall be glad to receive information concerning them from any source.

Loranthus maytenifolius A. Gray, *Bot. Wilk. Exp. Exped.* i, 1854, 739, t. 99. This species has not been discovered since, and in order to form a better idea of it I made a requisition for the loan of the type through Mr. Maiden, and received from the Gray Herbarium, Harvard University, a drawing of some fragments made by Mr. Schuyler Mathews. The only flowering fragment depicted, in my opinion, does not agree with the plate of *L. maytenifolius*, but it is suggestive of *L. alyxifolius* F. v. M. The buds depicted in the drawing are very slender. In fact, they are uniformly slender and resemble those of *L. alyxifolius* very closely, much more so than the buds of *L. maytenifolius* as figured at t. 99 by Gray. The sketch showing the anthers in the insert accompanying the drawing belongs to a free petalled species, and this removes it from *L. alyxifolius*. It would appear that mixed material was used in the determination of this species, and the author was unaware of the fact. I have not the least doubt that the plant figured (t. 99) is the same as *L. celastroides* Sieber, *Phrygilanthus celastroides* Eichl, and the anthers depicted belong to an island species, probably *L. insularum* A. Gray, or to a closely allied species.

An examination of the plates of *L. maytenifolius*, *L. celastroides*, and *L. insularum* will at once show the close similarity between the three species. The line of demarcation between them is the versatile anthers of *L. celastroides*, the terminal inflorescence and adnate anthers of *L. maytenifolius*, in contradistinction to the axillary inflorescence of *L. insularum*. In many specimens of *L. celastroides* the inflorescence is terminal. It is very singular that several Australian botanical workers, quite independently referred specimens of *L. celastroides* to *L. maytenifolius*.

EXPLANATION OF PLATES I-XII.

Plate i.

32. *L. Murrayi* F. v. M. et Tate.

1. Flowering branch, nat. size. 2. Bud, enlarged. 3. Flower, enlarged. 4. Anther, enlarged. 5. Pedicellate bract, showing the narrow wings. 6. Fruit, nat. size.

Plate ii.

33. *L. Mitchellianus* (Hook.) Blakely.

1. Flowering branch, nat. size. 2. Flower, enlarged. 3. Style with young fruiting calyx attached, enlarged. 4. Fruit with style attached, nat. size. 5. Longitudinal section of fruit.

Plate iii.

34. *L. Casuarinae* Miq.

1. Flowering branch, nat. size. 2. Bud, enlarged. 3. Flower, enlarged. 4. Base of leaf, enlarged.

Plate iv.

35. *L. Exocarpi* Behr.

1. Flowering branch, nat. size (W. Gill, No. 697). 2. Flower. 3. Anther, enlarged. 4. Fruit, nat. size. 5. Seed, nat. size. 6. Germinating seed, nat. size. 7. Seed with two radicles, nat. size. 8. Seedling plant (after Brittlebank). 9. Longitudinal section of seed and 10. cross-section of seed (both after Brittlebank). 11. Natural position of a seedling plant three months old.

Plate v.

35*a*. A. *L. Exocarpi* Behr, var. *tenuis*, n. var. Flowering branch, nat. size.

B. *L. Exocarpi* Behr, var. *flavescens* (Muell.) Miquel. Flowering branch, nat. size.

C. *L. Exocarpi* Behr, var. *venulosa*, n. var. Flowering branch, nat. size.

D. *L. Exocarpi* Behr, var. *spathulata*, n. var. 1. Fruit natural size, but the common peduncle and the elongated pedicel enlarged. 2. A small leaf, nat. size.

Plate vi.

36. *L. dictyophlebus* F. v. M.

1. Flowering branch, nat. size. 2. Bract, enlarged. 3. Bud, enlarged. 4. Flower, enlarged. 5. Bud showing the position of the style. 6. Calyx and apex of ovary. 7. Fruit, nat. size. 8. Germinating seed issuing apically from the epicarp, slightly enlarged. 9. Adventitious root and suctoral disc, nat. size.

Plate vii.

37. *L. acacioides* A. Cunn.

1. Flowering branch, nat. size. 2. Flower, enlarged. 3. Anther, enlarged. 4. A broad, thick leaf from Lennard River (W. V. Fitzgerald, No. 744).

Plate viii.

38. *L. homoplasticus*, n. sp.

1. Flowering branch, nat. size. 2. Flower opened out, enlarged. 3. Fruit, nat. size. 4. A reniform leaf. 5. Leaf of *Eucalyptus melanophloia* for comparison.

Plate ix.

39. *L. vitellinus* F. v. M.

1. Flowering branch, nat. size, with short broad leaves, the most common form. 2. Flowering branch with long narrow leaves, less common than (1). 3, 4. Buds, enlarged. 5. Flower, slightly enlarged. 6. Corolla opened out, enlarged. 7. Fruit, nat. size. 8. Fruit with seed issuing from the base of the epicarp. 9. Seed, nat. size. 10. Embryo, nat. size. 11. Embryo opened out, enlarged. 12. A germinating seed, nat. size. 13. A young seedling, nat. size.

Plate x.

A. 39*a*. *L. vitellinus* F. v. M., var. *glabrescens*, n. var.

1. Flowering branch, nat. size. 2. Bud detached, nat. size. 3. Types of calyx, enlarged. 4. Long leaf from Port Mackay, Amelia District, No. 2513.

B. 5. Portion of a young plant of *L. vitellinus* F. v. M. showing the first attachment and the adventitious roots, nat. size.

a. Host, *Eucalyptus corymbosa* Sm. *b*. First attachment. *c*. Adventitious root. *d*. Attachment of adventitious root. *e*. Shoot arising from adventitious root, attachment similar to first attachment.

Plate xi.

40. *L. odontocalyx* F. v. M.

1. Flowering branch, nat. size. 2, 3. Immature bud and leaf of type. 4, 5. Immature bud and leaf of G. F. Hill's No. 539. 6. Bud, enlarged. 7. Flower, enlarged. 8. Corolla opened out, enlarged. 9. Anther, front view, enlarged. 10. Anther, back view, enlarged. 11. Fruit, nat. size, but not fully mature.

Plate xii.

41. *L. alyxifolius* F. v. M.

1. Flowering branch, nat. size. 2. Bud, enlarged. 3. Flower, enlarged. 4. A fruiting cymule, enlarged. 5. Fruit, nat. size.